



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

U.S. Patent Application No.: 10/734,566

Confirmation No.: 1877

Applicants: LIHL, Reinhard et al.

Customer No.: 24041

Filed: December 12, 2003

For: APPARATUS FOR CUTTING SPECIMENS HAVING
AN AUTOMATIC PRESETTING APPARATUS

TC/Art Unit: 3724

Examiner: PETERSON, Kenneth E.

Docket No.: LVIP:108US

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C. Richard Lohrman
Regis. No. 46,878

APPEAL BRIEF UNDER 37 C.F.R. § 41.37

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Commissioner for Patents
PO Box 1450
Alexandria, VA 22313-1450

Honorable Sir:

Appellants respectfully appeal the decision of the Examiner finally rejecting Claims 2-7 and 9 as set forth in his Office Action dated October 27, 2006. A Notice of Appeal was timely filed on November 22, 2006 and received by the United States Patent and Trademark Office on November 24, 2006. A petition for a one month extension to time and a check for \$620.00 are enclosed with this Appeal Brief.

A **Claims Appendix** begins on page 18 of this paper.

An **Evidence Appendix** begins on page 19 of this paper.

A **Related Proceedings Appendix** begins on page 20 of this paper.

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REAL PARTY IN INTEREST

The real party in interest is Leica Mikrosysteme GmbH, Assignee of the above application by assignment recorded in the Patent and Trademark Office at Reel 014803, Frame 0490.

RELATED APPEALS AND INTERFERENCES

Upon information and belief, no appeals or interferences are known to Appellants, which will directly affect, or will be directly affected by, or have a bearing on the Board's decision in this appeal.

STATUS OF CLAIMS

The application contained 20 claims.

Claims 1 and 8 have been canceled.

Claims 10-20 have been withdrawn.

Claims 2-7 and 9 stand as finally rejected.

Claims 2-7 and 9 are the subject of this Appeal.

STATUS OF AMENDMENTS

Amendments to Claims 2-7, substituting "microtome or ultramicrotome" for "cutting apparatus" in the preamble, were submitted subsequent to final rejection, but were denied entry by the Examiner. Amendments to Claims 2-7 and 9 under 37 CFR § 41.33 were submitted February 23, 2007. The amendments were filed to place the claims in the format required in the Office Action of October 27, 2006. These amendments also place the claims in better form for appeal as all claims are now directed to ultramicrotomes. At the time of filing of this Brief, Appellants do not know if the amendments filed under 37 CFR § 41.33 were entered into the record.

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SUMMARY OF THE CLAIMED INVENTION

The invention relates generally to an apparatus for cutting specimens, in particular a microtome or ultramicrotome which brings a specimen close to a knife of the microtome or ultramicrotome. The apparatus broadly comprises a light barrier arranged such that the relative motion between the knife and the specimen penetrates the light barrier and thereby ascertains a spacing between the knife and the specimen.

Claim 9

Claim 9 recites ultramicrotome **10** (See generally Page 3, Lines 14-18; Page 4, Lines 1-2) comprising knife **16**, defining knife edge **15**, knife holder **24** for clamping knife **16**, specimen holder **22** for holding specimen **14**, feed device for generating a relative motion between knife **16** and specimen **14** (See Fig 2, Reference Nos. **14**, **16** and **28**; Page 3, Lines 9-10 and 19-20; Page 4, Lines 4-5; Page 8, Lines 17-18), light barrier **30** (See Fig. 2 and 3, Reference No. **30**; Page 7, Lines 18-25) being arranged parallel to knife edge **15** and located between knife **16** and specimen **14** (See Fig. 2 and 3, Reference Nos. **14**, **15**, **16** and **30**; Page 8, Lines 2-4), the arrangement of light barrier **30** is such that the relative motion between knife **16** and specimen **14** penetrates light barrier **30** and thereby ascertains a spacing between knife **16** and specimen **14**. (Fig. 2, Reference Nos.**14**, **16**, **22** and **30**; Page 3, Lines 11-13 and 21-23).

GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

1. Whether Claims 2-7 and 9 are non-obvious under 35 USC §103(a) to a person having ordinary skill in the art at the time the invention was made and therefore patentable over U.S. Patent No. 5,535,654 (Niesporek)?

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2. Whether Claims 2-7 and 9 are non-obvious under 35 U.S.C. § 103(a) to a person having ordinary skill in the art at the time the invention was made and therefore patentable over U.S. Patent No. 4,532,838 (Söderkvist)?

ARGUMENT

- 1) Whether Claims 2-7 and 9 are non-obvious under 35 USC §103(a) to a person having ordinary skill in the art at the time the invention was made and therefore patentable over U.S. Patent No. 5,535,654 (Niesporek)?

- a) Summary of the Rejection:

The Examiner rejected Claims 2-7 and 9 under 35 USC §103(a) as being unpatentable over U.S. Patent No. 5,535,654 (Niesporek) More specifically, the Primary Examiner asserted:

The patent to Niesporek, et al. shows a microtome having most of the recited limitations including a sensing device (20, 44) controlling a feeder device (50) at different speeds (coarse speed, slicing speed). Niesporek determines the position of a sample relative to the blade via contact sensor (20) rather than a light barrier sensor. The Examiner noted that contact sensors and light barrier sensors are both very old as well known and also art recognized equivalents. When sensing the position of a workpiece or tool part, one of ordinary skill would know that he has a choice between a contact sensor and a light barrier sensor. Evidence of this can be seen in numerous patents. [See list below.] It would have been obvious to one of ordinary skill in the art to have modified Niesporek by making his contact sensor be a light barrier, since these are art recognized equivalents as set forth above, and also since light sensors (having no moving parts) are less likely to break.

If there is any doubt about the efficacy of light barrier sensors within microtomes, Examiner noted that light barrier sensors have long been employed for various purposes with microtomes. Evidence of this can be seen in numerous patents. [See list below.]

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Appellants respectfully request reversal of the Primary Examiner's rejection of Claims 2-7 and 9 for the reasons set forth below.

b) Brief description of the reference cited by the Examiner

1) Niesporek

Niesporek discloses a microtome that includes sample holder 51 for sample 22 to be sliced thinly by cutting knife 10. Sample holder 51, for performing a cutting movement (arrow 54) relative to knife holder 12, can be driven in a first spatial direction (arrows 54 and 56) by means of first drive 53, and for performing a course adjustment and a section thickness adjusting movement in a second spatial direction (arrow 54) perpendicular to the first spatial direction (arrows 54 and 56) by means of an electrical second drive device 50. In the vicinity of knife 10, a mechanical delimiting device 20 is provided with release lug 30 pivotally moveable on pivot axis 28. Release lug 30 is composed of lever arm 32, assigned to knife 10 or sample 22, and lever arm 34 assigned to electrical switch 36, electromagnet 38, and spring element 39. Pivoting of lever arm 32 from position 40 to an intermediate position will stop the coarse movement of knife 10 toward sample 22, i.e., a mechanical contact sensor stops coarse movement of sample 22 toward knife 10 at a predetermined position that corresponds to the moment when lever arm 32 is in the intermediate position.

c) Arguments regarding the rejection of Claims 2-7 and 9 under Niesporek

"To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in knowledge generally available to one having ordinary skill in the art, to modify the reference or combine reference teachings. Second, there must be a reasonable expectation of success. *Finally, the prior art reference (or the references when combined) must teach or suggest all the claim limitations.* The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on

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applicant's disclosure." MPEP § 2142 (citing *In re Vaeck*, 20 USPQ2d 1438 (Fed. Cir. 1991)) (emphasis added). Appellants respectfully submit that Niesporek fails to teach or suggest all the limitations of independent Claim 9; the light barrier recited in Claim 9 is not an art recognized equivalent to the delimiting device taught by Niesporek; and the proposed modification of Niesporek's invention changes the invention's principle of operation.

1) Niesporek fails as a reference to establish a *prima facie* case of obviousness against Claims 2-7 and 9.

Niesporek is directed to a microtome in which the sample holder for performing a cutting movement relative to the knife holder can be driven by a first drive device. The microtome is provided with a "delimiting device" that includes a lever arm that contacts the sample which causes the lever arm to pivot around an axis into an intermediate position. (See Niesporek, col. 6, lines 3-7.) Niesporek makes no mention of a light barrier or any other device that would act as a delimiting device without contacting either the specimen or the knife.

This lack of suggestion of a light barrier in Niesporek is emphasized by the fact that Niesporek does disclose the use of a photo sensor that is activated by the sample holder in its upper reversal position before the sample holder performs a cutting motion. (See Niesporek, col. 4, lines 60-67.) This is a clear indication that the inventor in Niesporek was cognizant of photocells and how they worked but at the time the invention in Niesporek was made, it was not obvious to a person of above ordinary skill in the microtome arts, namely the inventor in Niesporek, let alone a person of ordinary skill, to use a noncontact device such as a light barrier to measure the gap between the microtome knife and sample.

Therefore, Niesporek fails as a reference under 35 U.S.C. § 103 (a) to render Claims 2-7 and 9 obvious as it both fails to teach all the elements of those claims and it fails to suggest or teach any noncontact method of measuring the distance between a microtome knife and sample before the knife cuts the sample.

"If an independent claim is nonobvious under 35 U.S.C. §103, then any claim depending therefrom is nonobvious." *In re Fine*, 837 F.2d 1071, 5 U.S.P.Q.2d 1596 (Fed. Cir. 1988). Claims 2-7 depend from Claim 9 and thus incorporate all the limitations of that claim. Because,

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as discussed above, the Niesporek patent fails to render obvious Claim 9, it also fails to render obvious Claims 2-7.

2) Other listed references directed to microtomes do not teach or suggest the use of light barriers as claimed in Claims 2-7 and 9

Although the Examiner did not set forth a formal statement of rejection of Claims 2-7 and 9 under § 103 (a) combining the Niesporek patent with any other references, in discussing Niesporek, the Examiner did cite several references showing the use of light barriers in microtomes and/or ultramicrotomes. The references and the functions disclosed are listed as follows:

<u>U.S. Patent No.</u>	<u>Inventor(s)</u>	<u>Light Barrier Function</u>
3,785,234	Sitte	Device for Stroke Adjustment – control of rotating eccentrics by a light barrier
4,511,224	Sitte, et al.	Microtome with specimen illumination system – light shone through a specimen block
5,065,657	Pfeifer	Sensor is used to block a rotatable drive device holding knife or specimen
5,761,977	Jakobi, et al.	Cryostatic Microtome – light measures the height of an object table
6,253,653	Walter, et al.	Disc Microtome – light barrier checks angle of disc with respect to cutting blade

Significantly, in the five references the Examiner cites that teach the use of light sensors in microtomes, in none of them is there an explicit disclosure or explicit or implicit suggestion or teaching to use a light sensor as a light barrier between a microtome knife drive and/or a specimen drive. This includes a lack of a teaching or suggestion to measure the gap between a knife and a specimen using a noncontact method. Thus, nowhere in these references, all directed to microtomes, is there a suggestion to use a light sensor as a light barrier between a knife and a specimen holder to ascertain a measured space between that knife and the specimen holder. Consequently, Appellants respectfully submit that in all of the above references directed

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to microtomes, there is no recognition of the advantage of using a noncontact light barrier to prevent possible damage to either a microtome knife blade or a specimen by inadvertent contact of the knife with a specimen, a problem that exists in prior art microtomes and solved by the instant invention. Thus, Appellants respectfully submit that this absence of suggestion to use light sensors in this manner in the several references directed to microtomes is evidence of the non-obviousness of the inventions claimed in Claim 2-7 and 9.

3) Other references disclosing the use of light barriers between knives and target material to be cut are directed to nonanalogous art

Although no formal rejection of Claims 2-7 and 9 under § 103 (a) was set forth combining the Niesporek patent with any other references, in discussing Niesporek, the Examiner did cite several references showing the use of light barriers between cutting edges and target material to be cut. The references and subject matter are listed as follows:

<u>U.S. Patent No.</u>	<u>Inventor(s)</u>	<u>General Field</u>	<u>Light Barrier Function</u>
4,603,848	Markgraf, et al.	Sheet Separator	indicate a gap has been reached
5,004,392	Naab	Containers	light barrier for emptying garbage can into truck
5,327,763	Kramer, et al.	Extrusion Press	use of light barrier as a switch
5,488,886	Mohr	Sheet Cutting	use of light barrier to detect space between holdfast beam and target material
5,787,776	Nishimoto	Food Slicer	use of light barrier to detect when the end of a ham passes the light sensor to switch from standard to nonstandard slice

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5,822,970	Guttler	Textile Manufac.	Transport for bobbins and bobbins sleeves
6,532,719	Hannen, et al.	Packaging	Wrapping large objects
6,641,135	Weinheimer	Storage of Sheets	open/block entrance of banknotes into a storage box

The Examiner cites the above references as evidence that light barriers can be substituted for contact sensors. However, nothing in the listed references teaches or suggests that light barriers and contact sensors are recognized equivalents in the microtome arts. In addition, the Niesporek patent discloses no teaching or suggestion that the delimiting device, or contact sensor, is equivalent to a light barrier. Therefore, no cited reference or evidence put forth by the Examiner teaches or suggests the equivalence of light barriers and contact sensors in the microtome arts especially as related to measuring a gap between the knife and specimen in a microtome. Appellants also respectfully point out that in the references cited by the Examiner that are directed to microtomes, no mention is made of equivalence between contact sensors and light barriers. Thus, outside the unsupported assertions from the Examiner in the Final Office Action, there is no evidence offered that shows that light barriers are art recognized equivalents of contact sensors *in the microtome or ultramicrotome arts*. **Equivalency must be recognized in the relevant prior art** and cannot be based upon the Appellants' own disclosure or the mere fact that the components at issue are functional or mechanical equivalents. *See MPEP §2144.06; In re Ruff, 256 F.2d 590, 118 USPQ 340 (CCPA 1958)* (emphasis added). Therefore, the references listed above directed to inventions other than microtomes are invalid as references under § 103 (a) as they are all directed to nonanalogous fields that are outside the microtome arts.

Furthermore, the “nonmicrotome” nonanalogous disclosures cited by the Examiner are not reasonably pertinent to the problem with which the instant invention is concerned. The problem that the instant invention seeks to address is to create a reliable measurement system that permitted non-contact, accurate measurement of the spacing between a knife and a specimen to prevent inadvertent contact between the knife and the specimen. In so doing, it seeks to use a light barrier on a microtome to prevent damage to a microtome knife or to a specimen being cut,

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and to increase the precision of the cutting action of the microtome. In contrast, nonanalogous references do not teach, suggest, or motivate using a light barrier to prevent damage to the cutting mechanism or the sample being cut. Neither do they teach or suggest or provide motivation to use a light barrier to increase the precision of the cutting action of a blade. The problem Mohr seeks to address is related to optimizing the process of cutting sheets of material in a machine with a blade and a holdfast beam. Specifically, Mohr seeks to eliminate inefficient movement of a blade in a paper cutting machine, by tying the upper limit that the blade would travel to the upper limit that the holdfast beam traveled as it rises to create a gap sufficient to move new target sheets under the blade rather than rely on a predetermined gap height.

In Markgraf, the light barrier is used to indicate when contact is made with a sheet, thus indicating when a gap is broken. (See Markgraf, col. 9, lines 20-35.) In Naab, a light barrier is disclosed as replacing a contact sensor to measure when a gap is closed to trigger the emptying of a refuse bin. (See Naab, col. 9, line 43 to col. 10, line 17.) Similar to Mohr, Kramer teaches the use of a light barrier or an equivalent contact switch to indicate when air nozzles should be rapidly lifted when a gap is broken by extruded workpieces. (See Naab, col. 4, lines 49-54.) Noshimoto teaches the use of a light sensor to determine when a gap is opened when the rear end of a ham passes the light barrier. The creation of the gap indicates to the food slicer as to when to start to make nonstandard slices. (See Nishimoto, col. 5, lines 24-64.) Güttsler teaches the use of light sensors or contact switches to detect gaps in a bobbin transports apparatus. (See Güttsler col. 6, lines 21-24.) Hannen discloses the use of light sensors or contact switches to indicate when a package enters an open frame on a conveyor. (See Hannen, col. 3, lines 52-54.) Weinheimer teaches the use of contact switches or light barriers to indicate when a slot or gap is open or closed to allow the placement of bank notes into a storage box. (See Weinheimer, col. 7, lines 56-63.) Thus, while all of the cited “nonmicrotome” nonanalogous references are directed to using light barriers or contact switches to determine whether a gap is opened or closed, none of them are pertinent to the problem of measuring a gap between a knife and a specimen that already exists and is not closed before measurement which is the problem solved by Appellants' claimed invention.

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To show that a reference is analogous to the rejected application “the reference must either be in the field of the applicant’s endeavor or, if not, then be reasonably pertinent to the particular problem with which the invention was concerned.” *In re Oetiker*, 977 F.2d 1443 (Fed. Cir. 1986). Appellants respectfully submit that none of the references cited by the Examiner that are outside the field of Appellants’ endeavor, namely microtomes, are in the field of endeavor nor are they reasonably pertinent to the problem addressed by Appellants invention.

4) The proposed modification of Niesporek’s invention changes the invention’s principle of operation

The Examiner asserted that it would have been obvious to one of ordinary skill in the art to have modified Niesporek by replacing his contact sensor with a light barrier. The Examiner’s proposed modification eliminates the contact sensor utilized in Niesporek in exchange for the light sensor utilized in Mohr. However, if the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teaching of the references are not sufficient to render the claims *prima facie* obvious. See *In re Ratti*, 270 F.2d 810, 813 (CCPA 1959); MPEP §2143.01. A primary principle of operation of Niesporek requires the sensor to be in contact with the specimen to determine the stopping point of the course movement. By eliminating the contact sensor from the Niesporek invention, Examiner’s modification has not only changed the principle of operation of this reference, it has completely stripped the basic principle upon which it operates. Substantial reconstruction of a primary reference in this manner cannot create a sufficient basis to render claims *prima facie* obvious. See *In re Ratti*, 270 F.2d 810. Contact between the specimen and the contact sensor is the principle of operation of the Niesporek invention, and since removing this feature from Niesporek would require a change in the basic principle under which Niesporek operates, the modification cannot be used to establish a *prima facie* case of obviousness.

Accordingly, the modification of Niesporek suggested by the Examiner changes the principle of operation of Niesporek and thus cannot establish a *prima facie* case of obviousness. Therefore, Claim 9 is patentable over Niesporek. Claims 2-7, which are dependent from Claim 9,

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are also patentable over Niesporek. In view of the foregoing, Appellants request that the Board reverse of the rejection of Claims 2-7 and 9 as unpatentable over Niesporek.

2. Whether Claims 2-7 and 9 are non-obvious under 35 U.S.C. § 103(a) to a person having ordinary skill in the art at the time the invention was made and therefore patentable over U.S. Patent No. 4,532,838 (Söderkvist)?

a) Summary of the Rejection

The Examiner rejected Claims 2-7 and 9 under 35 USC §103(a) as being unpatentable over U.S. Patent No. 4,532,838 (Söderkvist) More specifically, the Primary Examiner asserted:

Söderkvist shows an ultramicrotome with most of the recited limitations including a knife (1), a knife holder (8, 10), a specimen holder (15), a linear feed device (col. 3, lines 11-15), and a light barrier with transmitter (3) and a receiver (9). Since Söderkvist is an ultramicrotome, by definition, it cuts slices thinner than 300 nanometers.

In regards to claim 2, the light barrier crosses the height of the knife as seen in figure 1. With regards, to claims 3 and 5, Söderkvist's sensor is coupled to the knife holder. With regards, to claims 9 and 6, Söderkvist's light barrier extends perpendicular to the knife edge, as opposed to being parallel to the knife edge (claim 9) and stationary (claim 6). Söderkvist's light barrier is a rather complex system, involving mirrors, reflections, and transmitter adjustments. Examiner notes that it is much more common to employ a simple light barrier system, such as that seen in Jakobi '977 (lines 48-50, column 7), Nishimoto '766 (21, 22) or Mohr '866 (figure 6, parallel knife edge). It would have been obvious to one of ordinary skill in the art to have modified Söderkvist by employing the simpler stationary light barrier, as shown by Jakobi, Nishimoto, and Mohr, since these are art recognized equivalents known for the same purpose, and to have made it parallel to the knife edge, as seen in Mohr, in order to most accurately gauge the distance to contact.

Appellants respectfully request reversal of the Primary Examiner's rejection of Claims 2-7 and 9 for the reasons set forth below.

b) Brief description of the reference cited by the Examiner

Söderkvist discloses a method in a microtome, especially an ultramicrotome, in which a knife edge, turnable around its longitudinal axis, is used to cut sections from a specimen by making the specimen downwardly pass over the knife edge. The distance between the knife edge and the specimen before cutting is made extremely narrow without the specimen touching the knife. The slit is lit up from below by a light waveguide, one end of which is located under the knife edge and is turned with this and the other end of which is lit up by a light source movable in relation to the turning of the knife edge. The light from the waveguide is reflected against the surfaces of the knife as well as of the specimen which are turned towards the slit. The image of the knife surface reflected in the specimen surface, the size of which is proportional to the breadth of the slit, is viewed from at least one point located in a vertical plane outside of the vertical plane of the slit and on the same side of this as the knife.

c) Arguments regarding the rejection of Claims 2-7 and 9 under Söderkvist

1) Söderkvist fails as a reference to establish a *prima facie* case of obviousness against Claims 2-7 and 9

To establish a *prima facie* case of obviousness, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. In addition, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). Appellants respectfully submit that Söderkvist fails as a reference under § 103 (a) as it fails to each or suggest all the limitations of independent Claim 9. As noted by the Examiner in the Office Action dated October 27, 2006, Söderkvist fails to disclose a light barrier in which the relative linear motion of the knife blade penetrates the light barrier as claimed in Claim 9. Rather than

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provide a simple stationary light barrier that this penetrated by a moving knife, Söderkvist teaches a light guide comprising a wave guide prism that is attached to a carrier with the carrier located in cradle 10. Cradle 10 allows the knife edge to turn and the light beams from the light guide to turn with the knife to thus always run along the knife edge. Because the light beams always run along the knife edge, the knife never penetrates the light beam. Moreover, there is no suggestion in Söderkvist to modify the light guide apparatus be removing it from the cradle and fixing it in place so the knife can penetrate the beams from the light guide. Consequently, Söderkvist fails a reference under § 103 (a) to establish a *prima facie* case of obviousness against Claim 9 as it fails to teach or suggest all the limitations of that claim.

“If an independent claim is nonobvious under 35 U.S.C. §103, then any claim depending therefrom is nonobvious.” *In re Fine*, 837 F.2d 1071, 5 U.S.P.Q.2d 1596 (Fed. Cir. 1988). Claims 2-7 depend from Claim 9 and thus incorporate all the limitations of that claim. Because, as discussed above, the Söderkvist patent fails to render obvious Claim 9, it also fails to render obvious Claims 2-7.

2) The other listed references directed to microtomes does not teach or suggest the use of light barriers as claimed in Claims 2-7 and 9

Although the Examiner did not set forth a formal statement of rejection of Claims 2-7 and 9 under § 103 (a) combining the Söderkvist patent with any other references, in discussing Söderkvist, the Examiner did cite the Jakobi patent showing the use of light barriers in microtomes and/or ultramicrotomes. Jakobi is directed to a cryostatic microtome in which a light barrier is used to measure the height of an object table. Like Söderkvist, Jakobi makes no suggestion to position a light sensor across the path followed by a microtome knife toward a specimen or the reverse in which a specimen holder is moved toward a knife. This includes a lack of a teaching or suggestion to measure the gap between a knife and a specimen using a noncontact method. Thus, Appellants respectfully submit that this absence of a teaching or suggestion to use light sensors in this manner in the sole example reference directed to microtomes is evidence of the non-obviousness of the inventions claimed in Claim 2-7 and 9.

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3) Other references disclosing the use of light barriers between knives and target material to be cut are directed to nonanalogous art

Although no formal rejection of Claims 2-7 and 9 under § 103 (a) was set forth combining the Söderkvist patent with any other references, in discussing Söderkvist, the Examiner did cite several references outside the microtome arts, (“nonmicrotome”) showing the use of light barriers between cutting edges and target material to be cut. The references and subject matter are listed as follows:

<u>U.S. Patent No.</u>	<u>Inventor(s)</u>	<u>General Field</u>	<u>Light Barrier Function</u>
5,488,886	Mohr	Sheet Cutting	use of light barrier to detect space between holdfast beam and target material
5,787,776	Nishimoto	Food Slicer	use of light barrier to detect when the end of a ham passes the light sensor to switch from standard to nonstandard slice

The “nonmicrotome” nonanalogous disclosures cited by the Examiner are not only outside the field of endeavor of the Appellants’ invention, they are not reasonably pertinent to the problem with which the instant invention is concerned. The problem that the instant invention seeks to address is to create a reliable measurement system that permitted non-contact, accurate measurement of the spacing between a knife and a specimen to prevent inadvertent contact between the knife and the specimen. In so doing, it seeks to use a light barrier on a microtome to prevent damage to a microtome knife or to a specimen being cut, and to increase the precision of the cutting action of the microtome. In contrast, the “nonmicrotome” nonanalogous references do not teach, suggest, or motivate using a light barrier to prevent damage to the cutting mechanism or the sample being cut. Neither do they teach, suggest or provide motivation to use a light barrier to increase the precision of the cutting action of a blade.

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The problem Mohr seeks to address is related to optimizing the process of cutting sheets of material in a machine with a blade and a holdfast beam. Specifically, Mohr seeks to eliminate inefficient movement of a blade in a paper cutting machine, by tying the upper limit that the blade would travel to the upper limit that the holdfast beam traveled as it rises to create a gap sufficient to move new target sheets under the blade rather than rely on a predetermined gap height.

Noshimoto teaches the use of a light sensor to determine when a gap is opened when the rear end of a ham passes the light barrier. The creation of the gap indicates to the food slicer as to when to start to make nonstandard slices. (See Nishimoto, col. 5, lines 24-64.) Thus, both of the cited “nonmicrotome” nonanalogous references are directed to using light barriers or contact switches to determine whether a gap is opened or closed, none of them are pertinent to the problem of measuring a gap between a knife and a specimen that already exists and is not closed before measurement which is the problem solved by Appellants’ claimed invention.

To show that a reference is analogous to the rejected application “the reference must either be in the field of the applicant’s endeavor or, if not, then be reasonably pertinent to the particular problem with which the invention was concerned.” *In re Oetiker*, 977 F.2d 1443 (Fed. Cir. 1986). Appellants respectfully submit that none of the references cited by the Examiner that are outside the field of Appellants’ endeavor, namely microtomes, are in the field of endeavor nor are they reasonably pertinent to the problem addressed by Appellants invention.

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CONCLUSION

For the reasons set forth above, Appellants respectfully submit that Claims 2-7 and 9 are non-obvious under 35 U.S.C. §103(a) to a person having ordinary skill in the art at the time the invention was made and therefore patentable over U.S. Patent No. 5,535,654 (Niesporek). Accordingly, Appellants pray that this Honorable Board will reverse the Primary Examiner's rejection of Claims 2-7 and 9.

Respectfully yours,



C. Richard Lohrman
Registration No. 46,878
Attorney for Applicant
Simpson & Simpson, PLLC
5555 Main Street
Williamsville, NY 14221
Phone: (716) 626-1564
Fax: (716) 626-0366

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CRL/AEM
Attachment

CLAIMS APPENDIX

Reprinted herebelow are the claims involved in this appeal:

2. The ultramicrotome as defined in Claim 9, wherein the light barrier is arranged substantially at the height of the knife blade and at a defined spacing between the knife and the specimen.
3. The ultramicrotome as defined in Claim 9, wherein the light barrier is arranged in stationary fashion with respect to the knife or to the specimen.
4. The ultramicrotome as defined in Claim 9, wherein the light barrier comprises a transmitter of electromagnetic radiation, in particular a laser or an LED, and a receiver of electromagnetic radiation.
5. The ultramicrotome as defined in Claim 4, wherein the transmitter and the receiver are mechanically coupled to the knife holder or to the specimen holder.
6. The ultramicrotome as defined in Claim 5, wherein the transmitter and the receiver are mounted in stationary fashion, in a housing wall of the cutting apparatus.
7. The ultramicrotome as defined in Claim 9, wherein an alternating drive system for moving the specimen at different speeds is further provided in the cutting apparatus.
9. An ultramicrotome comprising: a knife, defining a knife edge, a knife holder for clamping the knife, a specimen holder for holding a specimen, a feed device for generating a relative linear motion between the knife and the specimen, a light barrier being arranged parallel to the knife edge and located between the knife and the specimen, the arrangement of the light barrier is such that the relative linear motion between the knife and the specimen penetrates the light barrier and thereby ascertains a spacing of a few micrometers between the knife and the specimen to prevent contact between the knife and specimen, and to facilitate the cutting of specimen sections that are 300 nanometers or less thick.

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EVIDENCE APPENDIX

No additional evidence is being submitted with this appeal.

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RELATED PROCEEDINGS APPENDIX

Upon information and belief, no appeals or interferences are known to Appellants, which will directly affect or be directly affected by or have a bearing on the Board's decision in this appeal.